QUARTERLY SUMMARY

OF THE

IMPROVEMENTS AND DISCOVERIES

IN THE

MEDICAL SCIENCES.

ANATOMY AND PHYSIOLOGY.

1. *Epithelium of Air-Vesicles.*—Dr. C. O. Weber says that there is no doubt of the existence of this epithelium, at least in the fœtus. In a fœtus four months old it may be easily isolated from a pulmonary vesicle in the form of a small spherical mass.—*Gaz. Méd. de Paris*, June 16, 1866, from *Virchow's Archiv.*

2. *Structure of the Kidney.*—M. Chrzonszczewsky combats Henle's ideas on the structure of the kidney. He injects carminate of ammonia into the jugular vein of a rabbit; the carmine passes into the vessels and thence into the uriniferous tubes and the urine. To colour the vessels alone, he ties the renal veins immediately after injecting the jugular, then the artery; to colour the uriniferous tubes only, he ties the ureter and injects through the renal artery a saline solution, which removes all the colouring matter deposited in the vessels of the kidney. The principal results at which he had arrived are the following: The uriniferous tubes end in three ways: in anastomoses, in *culs-de-sac*, and in Malpighian corpuscles. The anastomoses, which are very numerous in man, in the calf, and in the pig, are met with chiefly in the cortical substance. The termination in *cul-de-sac* is very rare; but there is no doubt of its existence. The Malpighian corpuscles (or rather capsules) are continuous with the tortuous tubes alone, and each with only one. The Malpighian capsule is lined with pavement-epithelium; the internal surface of the glomerulus of vessels is also covered with epithelium, but of larger cubic cells, more resembling the tortuous tubes. The Malpighian capsules communicate with the flexuous tubes, and through them with the straight tubes; and all may be injected through the ureter. In the looped canals described by Henle two kinds are to be distinguished: 1. Some described already by Ferrein, found in the peripheral portion of the medullary substance, are merely loops of flexuous tubes burying themselves in this substance. 2. Others, reaching the summits of the pyramids, are merely vessels.—*Gaz. Méd. de Paris*, June 16, 1866, from *Virchow's Archiv.*

3. *Alteration of Organic Structure by Congelation.*—In a paper on the congelation of animals by Dr. Davy, in which the author arrives at the almost self-evident conclusion that perfect congelation is antagonistic to life, he refers to the alteration of structure from the same cause. Muscle, according to Dr. Davy, after having been frozen, showed a well-marked difference under the microscope. When thawed the striated structure was no longer visible, and after a few hours—viz., on the following morning—whilst the unfrozen muscles had undergone no perceptible alteration, those which had been frozen had become of increased tenderness, yielding to a slight rending force, and breaking

short, as if the coherence of the particles forming the fasciculi was greatly diminished.—*Med. Press and Circular*, Nov. 21, 1866.

4. *Myographion.*—Dr. WM. RUTHERFORD, of Edinburgh, gave a description to the British Medical Association of a most ingenious instrument—Du Bois Reymond's Myographion; and performed with it the remarkable experiment devised by Helmholtz to measure the rapidity of nerve-force. He described the instrument as consisting of three principal parts: 1. A glass cylinder turned by clockwork, having a dial by which the rate of the cylinder's revolution may be ascertained with the greatest precision. Before each experiment, the cylinder is smoked, and so permits the point of a stilette to make a tracing upon it. 2. Arrangements for fixing the gastrocnemius and sciatic nerve of a frog, and for connecting the muscle with the stilette. The femoral extremity of the muscle is secured by a pair of forceps; and the tendo-Achillis is connected by hooks with a movable beam, having at its one extremity a stilette. When the muscle contracts, the beam is raised; and the stilette, being in contact with the cylinder, produces a tracing corresponding to the contraction of the muscle. The muscle and nerve are surrounded by a glass case containing wet blotting-paper, to prevent the tissues from becoming dry. 3. Arrangements by which the nerve is irritated, and the muscle thereby thrown into action at a given point of time. The nerve is irritated by breaking a constant electrical current sent through it. Two pairs of wires are placed in contact with the nerve; one pair as near the entrance of the nerve into the muscle as possible, and the other at a point of nerve about two inches from the muscle. The wires are connected with a simple contrivance called an inverter, by means of which the current from a battery and galvanic machine can be sent through one pair of wires in contact with the nerve or the other; the object of the experiment being to ascertain how long the nerve-force takes to pass from the point of nerve over the one pair of wires to that over the other. The part of the instrument by which the electrical current is broken, and irritation of the nerve thereby produced at a given moment, consists of a round brass box, fixed to the axle of the cylinder, and rotating with it. The box contains a movable weight; and as it revolves, the weight, from centrifugal force, moves outwards; and, when it had reached a certain point, it suddenly breaks the electric circuit, and so throws the muscle into action. By means of the dial upon the clockwork, the rate of the cylinder's revolution, just when the current is broken, can be accurately ascertained; and, by means of a spiral spring attached to the weight in the brass box, the rapidity with which the weight moves outwards may be regulated, and so we can have the current broken when the cylinder revolves ten times or fifteen times in a second, and so on.

The experiment was begun by counting the velocity of the cylinder when the current was broken. It was found to be exactly fifteen revolutions in a second; the circumference of the cylinder being six inches—$6 \times 15 = 90$ inches linear of surface of cylinder—equal to a second of time. The cylinder was then blackened by means of turpentine smoke. The gastrocnemius and sciatic nerve of a frog were dissected out and attached in the manner above indicated; the electrical current was sent through the nerve close to the muscle, and the clockwork set in motion. When contraction had taken place, the instrument was stopped and re-arranged; the current was then sent through the portion of nerve two inches from the muscle, and the clockwork again set in motion, and stopped when the muscle had contracted. The cylinder was then rolled along a moistened sheet of gelatine, and an impression taken from it. It was then found that the commencement of the tracing produced after irritating the nerve two inches from the muscle was one-fifth of an inch distant horizontally from the commencement of that which had followed irritation of the nerve near the muscle. The nerve-force had taken an interval of time equivalent to the one-fifth of an inch of the cylinder's surface to pass from the point of nerve over the one pair of wires to that over the other; that distance was two inches. The next point was to find the value in time of the one-fifth of an inch. Ninety inches of the cylinder's surface corresponding to one second, one-fifth of an inch would, of course, be equivalent to 1-450th of a second. If it took 1-450th of a second to travel two inches, how long would it take to travel a foot? By simple proportion, it was found to be 1-75th of a second, which is, of course, equal to seventy-five feet per second. This is the usual rate in the frog.

The myographion of Du Bois Reymond is similar to that constructed by Helmholtz; the essential difference consisting in the arrangements for breaking the current at a given moment of time. In Du Bois Reymond's, this is effected with greater simplicity and precision.—*British Med. Journ.*, Aug. 25, 1866.

MATERIA MEDICA AND GENERAL THERAPEUTICS.

5. *Chlorate of Quinia.*—This newly-discovered salt (see No. of this Journal for July, 1866, p. 232), which the profession owes to Dr. LYONS, continues to be employed in his Clinique and in his private practice, we are informed, with most satisfactory results. In cases of scarlatina, typhus, all low pyrexial states, local inflammations, &c., the use of this drug is indicated, and so far as opportunities have yet been afforded for testing its efficacy, the results are reported to be highly favourable. From its chemical constitution and the large amount of available oxygen which is thrown into the system when this medicine is ordered, according to the formula recently furnished,[1] in solution with perchloric acid, valuable therapeutic effects may be anticipated *a priori*. The tonic alkaloid conveyed into the economy at the same time is a very important substitute for the potash in the ordinary salt hitherto employed (chlorate of potash). Dr. Lyons awaits an opportunity of testing the value of the chlorate of quinia in that malady in which, above all others, chlorate of potash has attained, according to Trousseau and Pidoux, its most important and indisputable triumph—namely, gangrenous stomatitis. Meanwhile he invites the co-operation of his professional brethren in testing the value of this hitherto unused salt.—*Medical Press and Circular*, June 20, 1866.

6. *Syrup of the Phosphates of Iron, Quinia and Strychnia.*—Dr. LYONS has for some time past employed with, he conceives, very important therapeutic results, this powerful tonic combination, for which the profession is mainly indebted to the late Dr. Eaton, of Glasgow, and Professor Aitken, of the Royal Victoria Hospital, Netley.

The concentrated syrup of the phosphates, when made by double decomposition, according to Professor Aitken's formula, contains per drachm two grains of the phosphate of iron, one grain of the phosphate of quinia, and one thirty-second of a grain of the phosphate of strychnia. It is a perfectly clear and limpid fluid, slightly refracting light with the peculiar tint of the quinia solutions, and viewed in mass, obliquely showing the bluish tint of the phosphate of iron held in solution. It is perfectly miscible with distilled water, has a strong styptic and distinctly chalybeate taste, and an aftertaste of quinia. It may be exhibited in doses of twenty to forty, and even sixty, minims, diluted with water, according to age and the circumstances of the case. It is well borne in the majority of cases; it acts as an invigorating stomachic and sensibly improves appetite; it is an admirable general tonic; it appears to be a readily assimilable chalybeate, and is thus well adapted for certain chlorotic and anæmic states. In the morbid states of the nervous system which precede and accompany the development of the strumous diathesis, the influence of the strychnia salt appears to be exercised with great potency as a nervine tonic and stimulant, and it would seem to be an important agent in altering the morbid state of the nervous apparatus which presides over the function of nutrient assimilation. Physiologically, this influence may be supposed to be attributable to the well-known action of the strychnia salts on the spinal cord, as well as by direct stimulus to the filaments of the great sympathetic plexuses distributed

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[1] See this Journal, July, 1866, p. 232.